

Lyme Disease Advisory Committee Meeting
November 13, 2014
Teleconference Sacramento, California

Committee members in attendance

Barbara Barsocchini, California Lyme Disease Association (LymeDisease.org)
Karen Chew, Lyme Disease Support Network
Vicki Kramer, Ph.D., California Department of Public Health (CDPH)
Robert Lane, Ph.D., University of California, Berkeley
James Miller, Ph.D., University of California, Los Angeles
Chris Parlier, Lyme Disease Support Network, Committee Chair
Raphael Stricker, M.D., California Medical Association (CMA)

Other attendees

Claudia Erickson, MS, CHES, Committee Coordinator
Anne Kjemtrup, DVM, Ph.D.
Melissa Yoshimizu, Ph.D., Public Health Biologist
Kerry Padgett, Ph.D., Supervising Public Health Biologist
Various members of the public (approximately 20)

1. Roll Call and Opening Comments

The conference call meeting was brought to order by Mr. Chris Parlier at 10:03 a.m.

2. Committee Member Updates

Dr. Jim Miller highlighted a publication in PLoS One that described a molecular technique which may be able to differentiate viable and nonviable spirochetes. This would potentially provide a tool to assess persistence of *Borrelia* in tissues. He reminded the committee of a paper published earlier in the year regarding a PCR diagnostic technique used to detect *Borrelia* in whole blood; no further studies to evaluate the test have been published. Dr. Miller indicated that existence of even one viable organism post treatment is significant.

Dr. Robert Lane reported that he is working with Dr. Janet Foley at UC Davis on *Anaplasma* species.

Dr. Ray Stricker reported that there is a federal Lyme disease bill (HR 4701: Tick-Borne Disease Research Accountability and Transparency Act of 2014) that passed the House of Representatives and is now pending a vote in the Senate.

Dr. Kerry Padgett announced and congratulated Dr. Lane on receipt of The Harry Hoogstraal Medal for Outstanding Achievement in Medical Entomology presented at the recent annual conference of the American Society of Tropical Medicine and Hygiene.

3. CDPH Progress Report

Claudia Erickson highlighted the public education activities of the CDPH Vector-Borne Disease Section (VBDS) in regards to tick bite prevention. VBDS conducted outreach to the general

public, local agencies, the medical community, and workers in potential tick exposure areas. Outreach occurred via local newspaper stories using VBDS information, educational talks, social media, grand round presentations at local hospitals, and statewide distribution of public health education materials. An occupational health project specifically targeting outdoor workers employed by the U.S. Forest Service, California State Parks, and open space reserves is in progress.

Committee comments:

- In response to a question, Ms. Erickson noted that distribution of materials to state parks was conducted following an informational email sent to all state parks. Those that responded received the material. Information was primarily sent to parks in the northwest and coastal regions.
- Ms. Erickson would appreciate being informed of educational events where CDPH materials are used.

Dr. Anne Kjemtrup summarized the human and tick surveillance activities conducted by CDPH. In 2013, nearly 120 cases of confirmed and probable Lyme disease were reported to CDPH. VBDS tick surveillance efforts were highlighted, including work with the National Park Service in the San Francisco Bay area as part of their Bioblitz (documenting diversity) program. Ticks collected from many regions of the state have been tested for *Borrelia burgdorferi* and *B. miyamotoi*. Adult *Ixodes pacificus* ticks are infected at approximately the same prevalence of *B. burgdorferi* and *B. miyamotoi* (1-2%), but nymphs are infected at a much higher prevalence of *B. burgdorferi* (3.7%) than for *B. miyamotoi* (1.2%). VBDS staff are focusing on collecting and testing *I. pacificus* nymphs, but are also collecting other species (e.g., *Dermacentor* spp.) for testing of other disease agents.

Committee comments:

- Dr. Stricker noted that the reporting form used by physicians has been simplified.
- Dr. Lane stated that information regarding the diversity of tick-borne disease agents should be emphasized in health education materials. California has some of the greatest biodiversity in the world.
- Dr. Stricker, citing a paper describing bacteria from *I. persulcatus* in China, added that use of new molecular tools reveal that ticks carry an enormous array of different bacterial species.
- Dr. Lane added that recent work in the northeastern United States identified eight novel viruses from ticks so we must keep an open mind about the viruses and bacteria that ticks may transmit.

4. Tick Surveillance for *B. burgdorferi* sensu lato in California

Dr. Melissa Yoshimizu presented highlights from a recently published manuscript authored by VBDS staff:

["Large Scale Spatial Risk and Comparative Prevalence of *Borrelia miyamotoi* and *Borrelia burgdorferi* Sensu Lato in *Ixodes pacificus*." PLoS One. 2014 Oct 21;9\(10\):e110853. doi: 0.1371/journal.pone.0110853.](https://doi.org/10.1371/journal.pone.0110853)

Abstract of manuscript:

"*Borrelia miyamotoi* is a newly described emerging pathogen transmitted to people by *Ixodes* species ticks and found in temperate regions of North America, Europe, and Asia. There is limited understanding of large scale entomological risk patterns of *B. miyamotoi* and of *Borrelia burgdorferi* sensu stricto (ss), the agent of Lyme disease, in western North America. In this study, *B. miyamotoi*, a relapsing fever spirochete, was detected in adult (n = 70) and nymphal (n = 36) *Ixodes pacificus* ticks collected from 24 of 48 California counties that were surveyed over a 13 year period. Statewide prevalence of *B. burgdorferi* sensu lato (sl), which includes *B. burgdorferi* ss, and *B. miyamotoi* were similar in adult *I. pacificus* (0.6% and 0.8%, respectively). In contrast, the prevalence of *B. burgdorferi* sl was almost 2.5 times higher than *B. miyamotoi* in nymphal *I. pacificus* (3.2% versus 1.4%). These results suggest similar risk of exposure to *B. burgdorferi* sl and *B. miyamotoi* from adult *I. pacificus* tick bites in California, but a higher risk of contracting *B. burgdorferi* sl than *B. miyamotoi* from nymphal tick bites. While regional risk of exposure to these two spirochetes varies, the highest risk for both species is found in north and central coastal California and the Sierra Nevada foothill region, and the lowest risk is in southern California; nevertheless, tick-bite avoidance measures should be implemented in all regions of California. This is the first study to comprehensively evaluate entomologic risk for *B. miyamotoi* and *B. burgdorferi* for both adult and nymphal *I. pacificus*, an important human biting tick in western North America."

Committee comments:

- Dr. Lane noted that other *Borrelia* species have been detected in California ticks including *B. carolinensis* and a new *Borrelia* genomospecies currently being characterized in his laboratory, and that of Dr. Gabi Margos in Germany.. There is great diversity of pathogens in California ticks.
- In response to a question from Ms. Barsocchini about his work in southern California, Dr. Lane noted that a different *Borrelia*, *B. americanum*, was found in ticks in southern California. It is unknown if this *Borrelia* can infect people. Dr. Lane encouraged including information about *Borrelia* diversity as well as regional differences in public education materials.
- In response to a question from Dr. Stricker regarding the effect of removing ticks from the environment on disease transmission risk, Dr. Yoshimizu noted that removal of ticks can reduce the population at a very localized level, but would not affect statewide disease risk. Dr. Lane emphasized that ticks are very productive (during their lifetime, *Ixodes* female ticks lay over 1000 eggs and Dermacentor ticks up to several thousand eggs."
- In response to a question, Dr. Kjemtrup stated that the online interactive tick map on the CDPH website currently includes *B. burgdorferi* sensu lato results and is updated annually; an online interactive map has not been developed yet for other tick-borne disease agents.
- Dr. Vicki Kramer noted that the interactive map has been very helpful in educating physicians about the existence of Lyme disease in California.

5. Re-Crafting Tick-bite Prevention Curriculum for Children

Ms. Claudia Erickson presented a proposal to re-craft the current Timothy Tickfinder (TTF) curriculum into a "toolkit." A toolkit is a collection of health education tools that can be used to

promote tick-bite prevention. Putting this material into a toolkit is a method to market the information in school and non-school settings. The toolkit will include all TTF materials and other items, such as the interactive surveillance map and information about repellents. The "Curriculum for Teachers" would be retired. The questions at the end of the TTF brochure would be updated. The brochure will be posted online in printer-ready format. The committee was asked to provide their input on this toolkit and suggest outreach groups.

Committee comments:

- Coaches for athletic groups would be a good target audience as children and young adults may venture away from the groomed fields and into areas where ticks might be found.
- The current material is fairly simple and probably would not be appropriate above the 6th grade level; it targets the 4th grade level. School outreach in high risk areas would be a good idea.
- Dr. Lane noted that it would be valuable to depict low risk and high risk habitats for encountering ticks. He would be happy to provide such illustrations.
- Outreach venue suggestions included:
 - Festival circuits
 - Rural counties where 4H groups are active
 - Boy Scouts and Girl Scouts
 - School assemblies
 - Local distribution through mosquito and vector control agencies.

6. General Public Comment Period

- A member of the public stated that the paper summarizing the findings of *Borrelia* in ticks did not address the issue of local risk since the data were presented at a state-wide level. Dr. Kjemtrup noted that individual county level information was available in the VBDS annual reports and via the online interactive map.
- A member of the public asked if Dr. Kjemtrup would provide grand rounds at other hospitals. Dr. Kjemtrup noted that she would be glad to give presentations as resources allow.

Dr. Kramer announced that the next LDAC meeting is scheduled for March 12, 2015 in Sacramento and she thanked all the presenters. Mr. Parlier echoed her sentiment, noting that the committee has accomplished a lot. He adjourned the meeting at 12 p.m.